

What is claimed is:

1. A titration method, comprising:

supplying a sample to a confluence point in a titration system;

supplying a titrant through a variable pump to the confluence point to mix with said sample to produce a mixed stream;

controlling the rate of flow of said titrant by varying said pump to increase or decrease the rate of flow of said titrant;

detecting a change in said mixed stream; and

changing the rate of flow of said titrant from increasing to decreasing, or from decreasing to increasing, upon said detection of a change in said mixed stream.

2. The titration method of claim 1, wherein controlling includes supplying a control voltage having a selected waveform to said pump, said waveform having an increasing slope which increases the rate of flow of said titrant and having a decreasing slope which decreases the rate of flow of said titrant.

3. The titration method of claim 2, wherein changing the rate of flow of said titrant includes supplying either said waveform increasing slope or said waveform decreasing slope to said pump in response to said detecting changes in a property of said mixed stream.

4. The titration method of claim 3, further including detecting a change in said mixed stream during at least one increasing slope and during at least one decreasing slope of said control voltage to thereby compensate for lag time in said system; and

determining titration equivalence flow from measured flow rates at said changes in said mixed stream.

5. A feedback controlled titration method, comprising:  
monitoring a property of the total flow of mixed titrant and sample flows;  
varying the titrant flow in a first direction;  
detecting a change in the monitored property; and  
varying the titrant flow in a second direction.

6. The method of claim 5, wherein varying the titrant flow includes controlling the rate of flow in said first and second directions in accordance with a predetermined waveform.

7. The method of claim 5, wherein varying the titrant flow in a first direction includes controlling the rate of flow in said first direction in accordance with a first waveform.

8. The method of claim 7, wherein varying the titrant flow in a second direction includes controlling the rate of flow in said second direction in accordance with a second wave form.

9. The method of claim 7, wherein varying the titrant flow in a second direction includes controlling the rate of flow in a second waveform which is the reverse of the first waveform.

10. The method of claim 5, further including repetitively detecting changes in the monitored property and upon each detected change reversing the direction of variation of said titrant flow to obtain an equivalence flow rate.

11. A feedback controlled titration method comprising:  
controlling the flow rate of a titrant in a mixed titrant and sample flow in accordance with a first pattern;

monitoring the mixed titrant and sample flow to detect a change in a property of the mixed flow and to produce a corresponding detector output signal; and changing the controlled titrant flow rate pattern in response to the detected change.

12. The method of claim 11, wherein changing the controlled titrant flow rate pattern includes reversing said first pattern.

13. The method of claim 11, wherein controlling the flow rate of a titrant includes varying the flow rate pattern.

14. The method of claim 13, wherein controlling the flow rate of a titrant includes increasing the flow rate in accordance with a preselected waveform.

15. The method of claim 14, wherein changing the controlled titration flow rate pattern includes decreasing the flow rate in accordance with said waveform.